MARKED-UP VERSION OF CLAIMS 1 THROUGH 4

1. (Amended) A circuit arrangement for the dynamic control of piezotranslators (2) with energy recovery by means of a single inductive intermediate store (1) which is arranged in series with the piezotranslators (2) as well as by clocked switches, wherein for achieving a predetermined linear voltage characteristic at the piezotranslator (2), the secondary circuit is designed as a half-bridge consisting of the clocked switches (3, 4) at whose output the inductive intermediate store (1) is arranged in series with the piezotranslator (2), with the clocked switches (3, 4) being externally controlled and operated at a high cycle or switching frequency in such a manner that the intermediate store is alternately connected with an upper or lower supply voltage ((UB/2) at the most, with the series connection of piezotranslator (2) and inductive intermediate store (1) carrying a superimposed bridge direct current; wherein the clocked switches (3, 4) are formed as MOS transistors (9), with an external diode (10) being connected in series with the clearance between contacts, and this series connection being bridged by a commutating diode (11) which is oppositely poled to the diode (10).

2. (Amended) The circuit arrangement according to claim 6 ~~1~~, wherein the clocked switches (3, 4) are formed as MOS transistors (9), with an external diode (10) being connected in series with the clearance between contacts, and this series connection being bridged by a commutating diode (11) which is oppositely poled to the diode (10).

3. (Amended) The circuit arrangement according to claim 1, comprising a final stage (18), wherein a current sensor (12) for generating a control voltage which is proportional to the output current of final stage (18) is arranged in the secondary circuit

of the piezotranslator (2) for controlling the arrangement, with the control voltage being connected with a first input of a first controller (13), wherein a ~~the~~ second input of the first controller (13) ~~being~~ is applied at an ~~the~~ output of a ~~the~~ second controller (14), at whose two inputs a predetermined reference variable according to the physical position of the piezotranslator (2) and an actual value which is proportional to the output voltage of the final stage (18) are applied.

4. (Amended) The circuit arrangement according to claim 3, wherein a third controller (19) is provided for ~~the~~ a positioning control, at whose first input the reference variable of the physical position of the piezotranslator (2) and at whose second input a mechanical actual value which is detected via a sensor (20) of the piezotranslator (2) are applied, with the output of the third controller (19) being connected with one of the inputs of the second controller (14).

MARKED-UP VERSION OF AMENDED PARAGRAPHS, LINES 1-10, OF PAGE 1

Circuit Arrangement for the Dynamic Control of Ceramic Solid-State Actuators

~~Description~~

Background of the Invention

1. Field of the Invention

The invention relates to a circuit arrangement for the dynamic control of ceramic solid-state actuators, such as for example, piezotranslators with energy recovery by means of magnetic intermediate stores ~~according to the preamble of claim 1~~ as well as a control loop for operating a piezotranslator.

2. Description of the Related Art

MARKED-UP VERSION OF AMENDED PARAGRAPH OF PAGE 5, LINES 14-18

Summary of the Invention

The object of the invention is solved ~~by means of a subject matter as it is defined in the valid claim 1~~ in that for achieving a predetermined linear voltage characteristic at the piezotranslator, the secondary circuit is designed as a half-bridge consisting of the clocked switches at whose output the inductive intermediate store is arranged in series with the piezotranslator, with the clocked switches being externally controlled and operated at a high cycle or switching frequency in such a manner that the intermediate store is alternately connected with an upper or lower supply voltage at the most, with the series connection of piezotranslator and inductive intermediate store carrying a superimposed bridge direct current as well as, ~~in the claims 4 and 5~~ as far as the closed loop control is concerned, by a third controller for a positioning control, at whose first input the reference variable of the physical position of the piezotranslator and at whose second input a mechanical actual value which is detected via a sensor of the piezotranslator are applied, with the output of the third controller being connected with one of the inputs of the second controller, wherein preferably the second controller feeds back the integral of the piezotranslator current in lieu of a voltage which is proportional to the output voltage of the final stage. The remaining dependent claims represent at least suitable embodiments or developments of the invention.

MARKED-UP VERSION OF AMENDED PARAGRAPH, LINES 10-30, OF PAGE 10

Brief Description of the Drawings

The invention will be described in more detail by means of embodiments as well as with reference to the figures in the following.

In the figures:

Fig. 1 shows a circuit diagram of the circuit arrangement for the dynamic control of piezotranslators with energy recovery;

Fig. 2 shows a configuration of the MOSFET switch with an external blocking diode and a commutating diode oppositely poled relative to same;

Fig. 3 shows a block diagram of the control system with an inner and an outer control loop comprising the optional possibility to adapt the outer control loop to the integration value of the current;

Fig. 4 is an illustration of the control system with additional positioning control;

Fig. 5 shows a block diagram for reducing the low-frequency voltage noise; and

Fig. 6 shows a block diagram of a known fine control.

Description of Preferred Embodiments